

VIRGINIA DEPARTMENT OF EDUCATION



Key Questions about Internet Connectivity in Virginia Schools

[Information about this survey](#)

What is the student to Internet connected computer ratio?

[Statewide Numbers](#)

[Ratios by type of school](#)

[Ratios by region](#)

[Ratios by percent of students on Free and Reduced Lunch](#)

[Ratios by percent of students on Free and Reduced Lunch for each region](#)

[Ratios by school size](#)

Where are Internet Computers used in Virginia Schools?

[Average number in each type of room](#)

Are Virginia Schools Connected to the Internet?

[Statewide](#)

[Connectivity by type of school](#)

[Connectivity by region](#)

[Connectivity by percent of students on Free or Reduced Lunch](#)

[Connectivity by school size](#)

Is filtering used?

[Schools using Internet filtering by region](#)

Are WANs in place?

[Schools connected to Division or Local WANs](#)

Are Internet Computers available for Administrative use?

[Administrative Use Information](#)

Who provides Internet service to Virginia schools?

[Virginia Internet Service Providers](#)

Virginia Department of Education
Internet Connectivity Survey
September 1999

Information About this Survey

The connectivity survey was conducted in August and September, 1999 by the Virginia Department of Education.

Who Responded

Number of Divisions Reporting	130
Number of Schools Included	1,803
Number of Students Represented	1,117,098

For More Information

Please contact Lan Neugent or Bethann Canada at the Virginia Department of Education (lneugent@pen.k12.va.us, bcanada@pen.k12.va.us), or visit the Department of Education's web site at www.pen.k12.va.us.

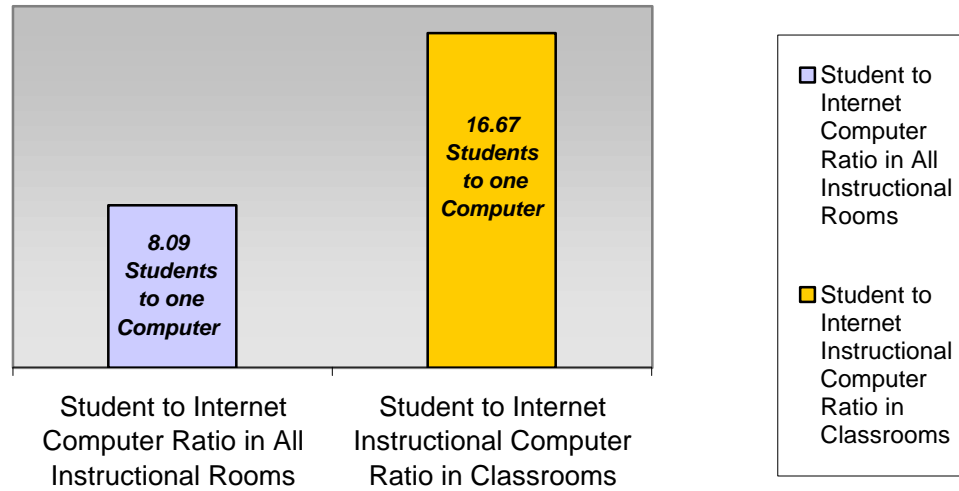
Virginia Department of Education Internet Connectivity Survey
September 1999

STUDENT TO INTERNET COMPUTER RATIOS

Virginia schools have an overall ratio of 8.09 students to one Internet-connected computer in all instructional rooms.

In the classroom only, however, the ratio increases to 16.67 students to one Internet-connected computer. This ratio falls short of the recommended ideal ratio of four to five students to one connected computer.

Student to Internet Computer Ratios



Statewide Student to Internet Computer Ratios

Number of Internet Capable and Connected Computers in Instructional Rooms	Number of Internet Capable and Connected Computers in Labs	Number of Internet Capable and Connected Computers in Library Media Centers	Total Internet Capable and Connected Computers for Instructional Use	Number of Students	Student to Internet Computer Ratio in All Instructional Rooms	Student to Internet Computer Ratio in Classrooms
53022	45131	11117	109270	884107	8.09	16.67

STATEWIDE INTERNET CONNECTIVITY

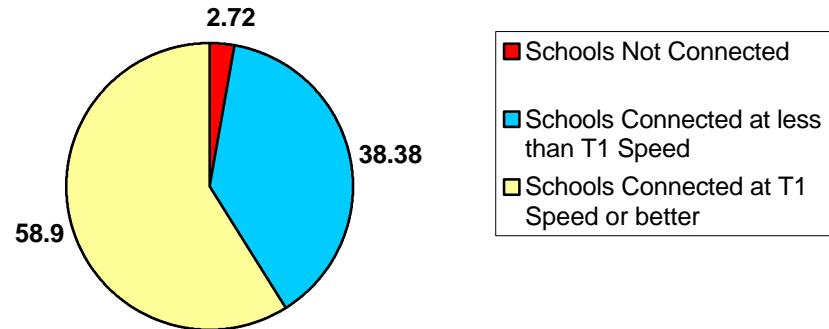
58.9 percent of Virginia schools are connected to the Internet at T1 speeds (1.544 megabits per second) or better. 38.38 percent are connected, but at less than T1 speed. Only 2.72 percent of Virginia schools have individual modem connections to the Internet or no connection at all.

T1 speeds allow schools to take advantage of the many new bandwidth-intensive applications available on the Internet.

To illustrate the speed of a T1 connection, all things being equal, the graphic below would take 5 seconds to download using a high speed modem connection and less than one second using a T1 line.



Virginia Statewide Connectivity

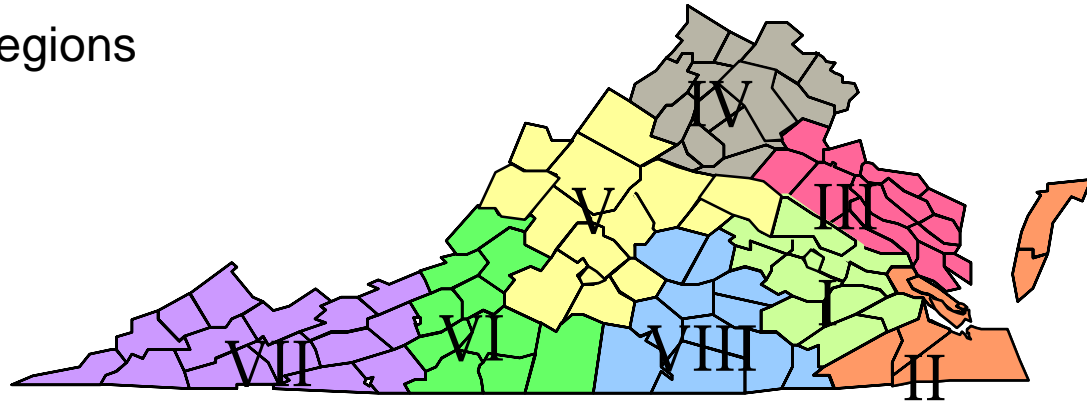


Who's Connected?		
Connectivity Status	Number	Percent
Schools Not Connected	49	2.72
Schools Connected at less than T1 Speed	692	38.38
Schools Connected at T1 Speed or better	1062	58.9

SCHOOLS USING INTERNET FILTERING BY REGION

Statewide, over 80 percent of schools use some type of Internet filtering technology. The use of filtering technology varies regionally, from 55 percent of schools in Region IV to 99 percent of schools in Region II. The percent of schools using filtering technology does not vary significantly by type of school.

Virginia Superintendent's Regions

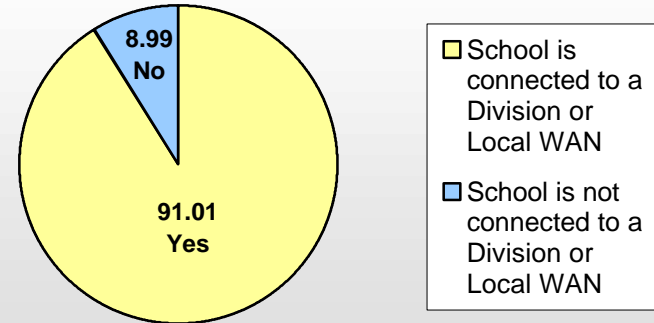


Percent of Schools using Internet Filtering by Region							
Region	Elementary Schools using	Middle Schools	High Schools using	Combined Schools	Special Ed Schools	Alternative Schools	Schools using
Region I	98.69	100.00	95.00	50.00	80.00	100.00	97.58
Region II	100.00	100.00	100.00	100.00	33.33	100.00	99.45
Region III	98.11	95.00	95.24	100.00	---	50.00	96.00
Region IV	55.29	58.62	60.38	75.00	41.67	16.67	54.91
Region V	61.60	66.67	70.97	75.00	---	33.33	63.78
Region VI	80.47	82.76	92.31	100.00	---	100.00	83.16
Region VII	80.95	93.75	76.74	81.82	---	---	81.18
Region VIII	100.00	100.00	100.00	100.00	---	0.00	97.18
STATE	80.02	84.73	83.64	83.33	46.88	59.46	80.37

SCHOOLS RECEIVING INTERNET SERVICE VIA WANS

Over 93 percent of schools in Virginia receive their Internet service via a school division or other local Wide Area Network. A single Internet connection providing service to multiple locations over a WAN is a cost-effective way to provide service to multiple locations.

Percent of Schools Receiving Internet via Division or Local WANS



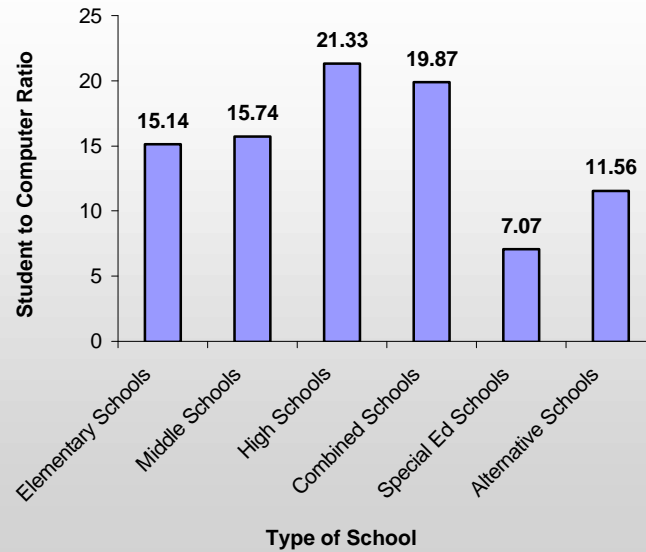
Are WANS in place?		
<i>Schools connected to Division or Local WAN</i>	<i>Number</i>	<i>Percent</i>
School is connected to a Division or Local WAN	1641	91.01
School is not connected to a Division or Local WAN	162	8.99

Virginia Department of Education Internet Connectivity Survey
September 1999

**STUDENT TO INTERNET
CONNECTED COMPUTER RATIO
IN THE CLASSROOM**

In Virginia's classrooms, the student to Internet-connected computer ratio ranges from 15.14 students to one computer in elementary schools to 21.33 students to one computer in high schools. Special Ed and Alternative schools have low student to Internet-connected computer ratios.

Student to Computer Ratio in the Internet Connected Classroom



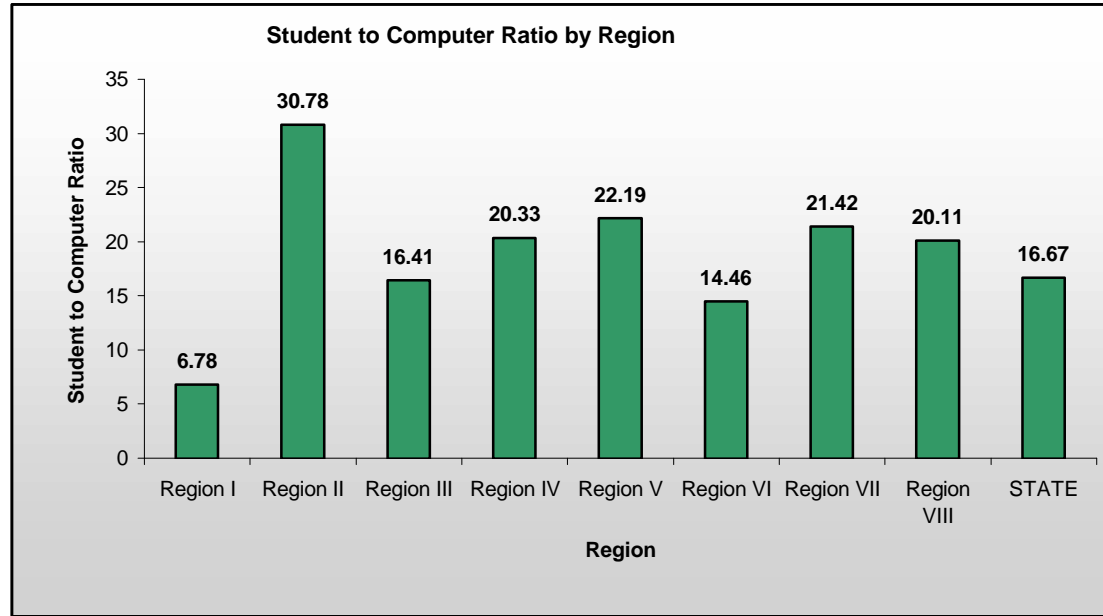
Internet Computers in the Classroom by Type of School

<i>Type of School</i>	Number of Students	Total Number of Instructional Rooms	Internet Computers in All Instructional Rooms	Student to Internet Instructional Computer Ratio in Classrooms only	Average Number of Internet Computers in Classrooms
Elementary Schools	433932	25669	28655	15.14	1.12
Middle Schools	180577	10709	11471	15.74	1.07
High Schools	246181	13522	11544	21.33	0.85
Combined Schools	19630	1391	988	19.87	0.71
Special Ed Schools	665	124	94	7.07	0.76
Alternative Schools	3122	340	270	11.56	0.79
TOTAL	884107	51755	53022	16.67	1.02

Virginia Department of Education Internet Connectivity Survey
September 1999

**STUDENT TO INTERNET
CONNECTED COMPUTER
RATIO BY REGION**

In the classroom, the student to Internet-connected computer ratio ranges from a low of 6.78 students to one computer in Region I to a high of 30.78 students to one computer in Region II. The statewide ratio is 16.67 students to one Internet-connected computer in Virginia's classrooms. Within any given region, the student to computer ratio varies widely from school to school

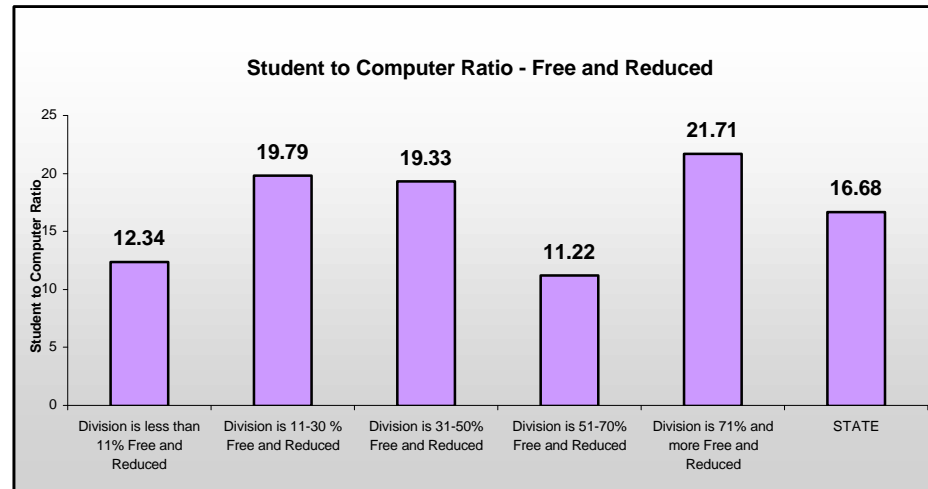


Internet Computers in the Classroom by Region							
Region	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms	Lowest ratio this region	Highest ratio this region
Region I	117845	6623	17385	6.78	2.62	4.73	1222.00
Region II	243702	13801	7917	30.78	0.57	8.22	588.53
Region III	66947	3904	4079	16.41	1.04	3.87	665.60
Region IV	160860	9365	7913	20.33	0.84	5.85	931.50
Region V	100207	5989	4516	22.19	0.75	8.44	3434.33
Region VI	90578	5448	6263	14.46	1.15	3.94	544.60
Region VII	72701	4465	3394	21.42	0.76	6.68	305.92
Region VIII	31267	2160	1555	20.11	0.72	9.83	2686.00
STATE	884107	51755	53022	16.67	1.02	3.87	3434.33

Virginia Department of Education Internet Connectivity Survey
September 1999

**STUDENT TO INTERNET-
CONNECTED
COMPUTER RATIOS --
FREE AND REDUCED
LUNCH PERCENTAGES**

The student to Internet-connected computer ratio is similar in school divisions with a low percentage of students eligible for free and reduced lunches and school divisions with a high percentage of eligible students. This suggests that this measure of wealth is not directly related to student access to the Internet in schools.



Internet Computers - Free and Reduced Lunch Students					
<i>Percent Students on Free/Reduced Lunch</i>	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms
Division is less than 11% Free and Reduced	58253	3413	4720	12.34	1.38
Division is 11-30% Free and Reduced	419852	23236	21211	19.79	0.91
Division is 31-50% Free and Reduced	241783	15357	12510	19.33	0.81
Division is 51-70% Free and Reduced	162721	9935	14502	11.22	1.46
Division is 71% and more Free and Reduced	1498	108	69	21.71	0.64
STATE	884107	52049	53012	16.68	1.02

Virginia Department of Education Internet Connectivity Survey
September 1999

Internet Computers in the Classroom by Region											
<i>Region</i>	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms	<i>Region</i>	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms
Region I						Region II					
Division is less than 11% Free and Reduced	15831	845	3347	4.73	3.96	Division is less than 11% Free and Reduced	2436	142	143	17.03	1.01
Division is 11-30 % Free and Reduced	56035	3070	7356	7.62	2.4	Division is 11-30 % Free and Reduced	133645	7381	2888	46.28	0.39
Division is 31-50% Free and Reduced	9297	602	657	14.15	1.09	Division is 31-50% Free and Reduced	42680	2659	1493	28.59	0.56
Division is 51-70% Free and Reduced	35184	1998	5956	5.91	2.98	Division is 51-70% Free and Reduced	64941	3619	3393	19.14	0.94
Division is 71% and more Free and Reduced	1498	108	69	21.71	0.64	Division is 71% and more Free and Reduced	0	0	0	---	---
Region I Totals	117845	6623	17385	6.78	2.62	Region II Totals	243702	13801	7917	30.78	0.57
Region III						Region IV					
Division is less than 11% Free and Reduced	0	0	0	---	---	Division is less than 11% Free and Reduced	26091	1448	160	163.07	0.11
Division is 11-30 % Free and Reduced	49783	2762	2189	22.74	0.79	Division is 11-30 % Free and Reduced	93380	5012	4433	21.06	0.88
Division is 31-50% Free and Reduced	14124	908	1504	9.39	1.66	Division is 31-50% Free and Reduced	30586	2066	1473	20.76	0.71
Division is 51-70% Free and Reduced	3040	234	386	7.88	1.65	Division is 51-70% Free and Reduced	10803	839	1847	5.85	2.2
Division is 71% and more Free and Reduced	0	0	0	---	---	Division is 71% and more Free and Reduced	0	0	0	---	---
Region III Totals	66947	3904	4079	16.41	1.04	Region IV Totals	160860	9365	7913	20.33	0.84

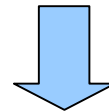
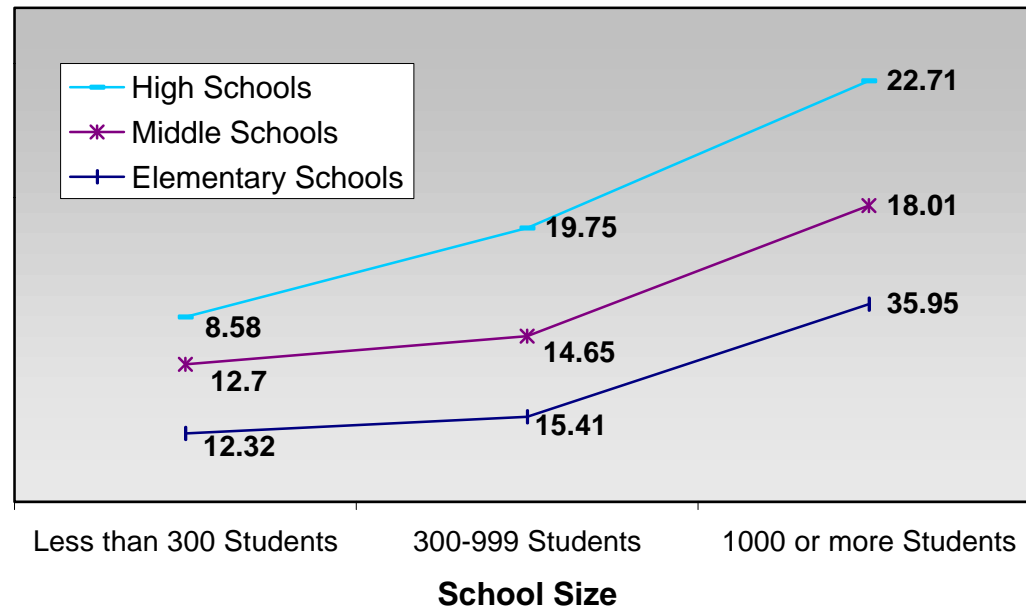
Virginia Department of Education Internet Connectivity Survey
September 1999

<i>Region</i>	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms	<i>Region</i>	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms
Region V						Region VI					
Division is less than 11% Free and Reduced	0	0	0	---	---	Division is less than 11% Free and Reduced	13895	978	1070	12.99	1.09
Division is 11-30 % Free and Reduced	66920	3816	2911	22.99	0.76	Division is 11-30 % Free and Reduced	18525	1094	1321	14.02	1.21
Division is 31-50% Free and Reduced	33287	2157	1595	20.87	0.74	Division is 31-50% Free and Reduced	36780	2434	1940	18.96	0.8
Division is 51-70% Free and Reduced	0	0	0	---	---	Division is 51-70% Free and Reduced	21378	1236	1932	11.07	1.56
Division is 71% and more Free and Reduced	0	0	0	---	---	Division is 71% and more Free and Reduced	0	0	0	---	---
Region V Totals	100207	5973	4506	22.24	0.75	Region VI Totals	90578	5742	6263	14.46	1.09
Region VII						Region VIII					
Division is less than 11% Free and Reduced	0	0	0	---	---	Division is less than 11% Free and Reduced	0	0	0	---	---
Division is 11-30 % Free and Reduced	1564	101	113	13.84	1.12	Division is 11-30 % Free and Reduced	0	0	0	---	---
Division is 31-50% Free and Reduced	59702	3454	3119	19.14	0.9	Division is 31-50% Free and Reduced	15327	1077	729	21.02	0.68
Division is 51-70% Free and Reduced	11435	910	162	70.59	0.18	Division is 51-70% Free and Reduced	15940	1099	826	19.3	0.75
Division is 71% and more Free and Reduced	0	0	0	---	---	Division is 71% and more Free and Reduced	0	0	0	---	---
Region VII Totals	72701	4465	3394	21.42	0.76	Region VIII Totals	31267	2176	1555	20.11	0.71
STATE	884107	51755	53022	16.67	1.02	STATE	884107	51755	53022	16.67	1.02

STUDENT TO INTERNET CONNECTED COMPUTER RATIO

Small schools tend to have the lowest student to Internet-connected computer ratios. The student to computer ratio increases with the size of the school, regardless of school type.

Student to Internet Connected Computer Ratio



Additional data on next page

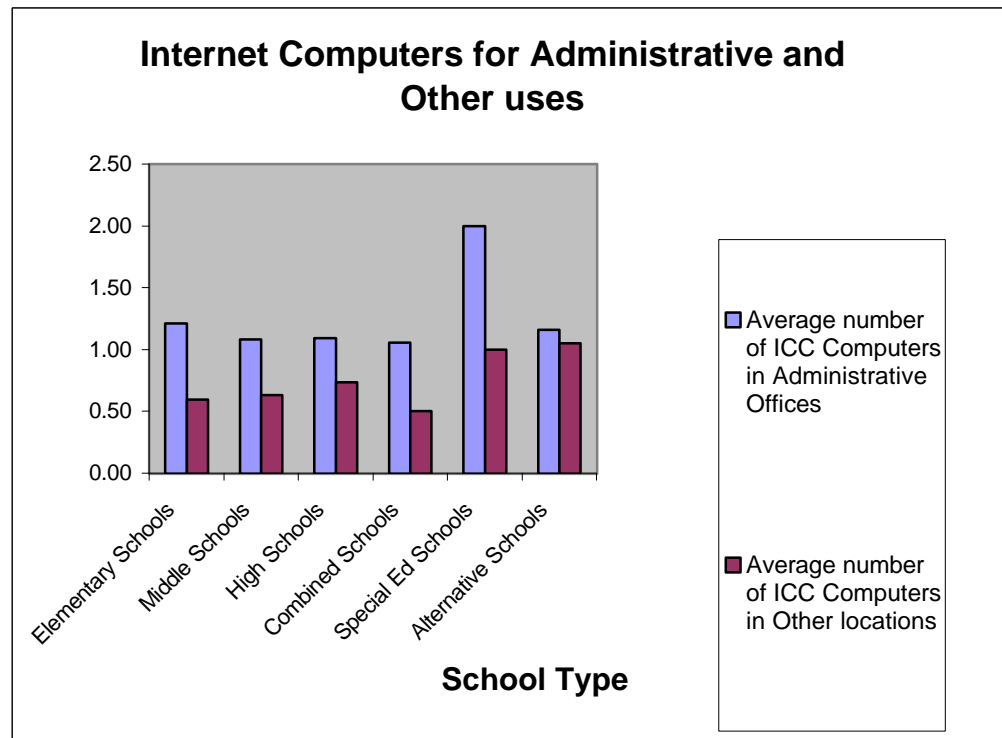
Virginia Department of Education Internet Connectivity Survey
September 1999

Student to Internet Computer Ratio - School Size						
<i>School Type</i>	<i>School Size</i>	Number of Students	Number of Classrooms	Internet Computers in Classrooms	Student to Internet Instructional Computer Ratio in Classrooms	Average Number of Internet Computers in Classrooms
Elementary Schools						
	Less than 300 Students	46271	3269	3757	12.32	1.15
	300-999 Students	380687	22036	24704	15.41	1.12
	1000 or more Students	6974	364	194	35.95	0.53
Middle Schools						
	Less than 300 Students	2870	185	226	12.7	1.22
	300-999 Students	108027	6678	7375	14.65	1.1
	1000 or more Students	69680	3846	3870	18.01	1.01
High Schools						
	Less than 300 Students	2470	217	288	8.58	1.33
	300-999 Students	79596	4817	4030	19.75	0.84
	1000 or more Students	164115	8488	7226	22.71	0.85
Combined Schools						
	Less than 300 Students	2354	240	166	14.18	0.69
	300-999 Students	16088	1095	766	21	0.7
	1000 or more Students	1188	56	56	21.21	1
Special Ed Schools						
	Less than 300 Students	665	124	94	7.07	0.76
	300-999 Students	0	0	0	---	---
	1000 or more Students	0	0	0	---	---
Alternative Schools						
	Less than 300 Students	2169	241	227	9.56	0.94
	300-999 Students	953	99	43	22.16	0.43
	1000 or more Students	0	0	0	---	---
STATE		884107	51755	53022	16.67	1.02

Virginia Department of Education Internet Connectivity Survey
September 1999

**INTERNET CONNECTED
AND CAPABLE
COMPUTERS FOR
ADMINISTRATIVE AND
OTHER USES**

There is at least one Internet connected and capable computer in all administrative offices in each school regardless of school type.

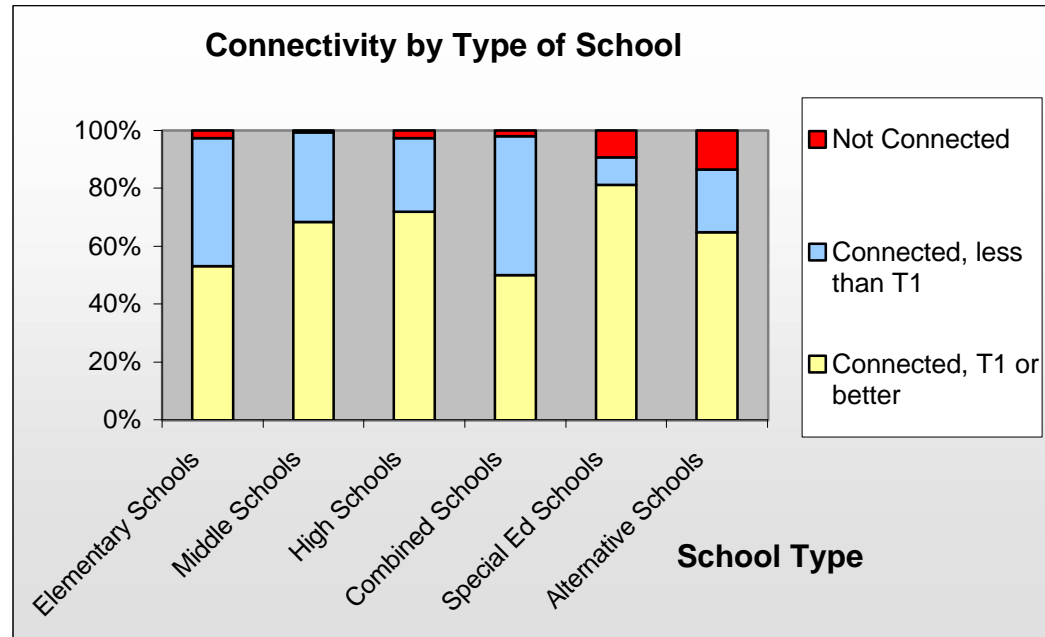


Administrative Computing						
Type of School	Number of Administrative Offices	Internet Computers in Administrative Offices	Average number of ICC Computers in Administrative Offices	Number of Other locations	Internet Computers in Other locations	Average number of ICC Computers in Other locations
Elementary Schools	2529	3057	1.21	2214	1321	0.60
Middle Schools	1295	1398	1.08	1002	635	0.63
High Schools	1858	2029	1.09	1615	1185	0.73
Combined Schools	198	209	1.06	72	36	0.50
Special Ed Schools	14	28	2.00	6	6	1.00
Alternative Schools	62	72	1.16	20	21	1.05
TOTAL	5956	6793	7.60	4929	3204	0.65

Virginia Department of Education Internet Connectivity Survey
September 1999

**INTERNET
CONNECTIVITY BY
TYPE OF SCHOOL**

The vast majority of Virginia schools are connected to the Internet, most with high-speed T1 lines. The percentage of high schools with high-speed T1 connections is slightly higher than any other type of school.



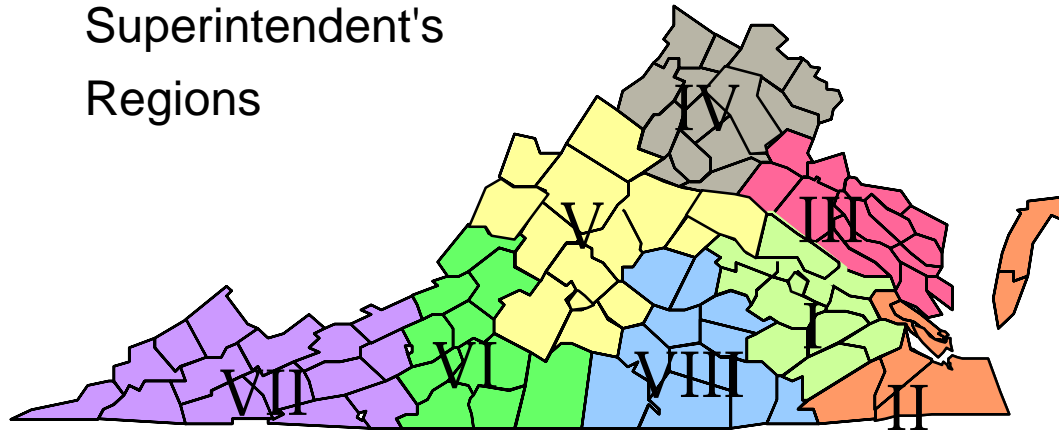
<i>Type School</i>	Total Number of Schools	Number not Connected	Number Connected less than T1	Number Connected T1 or better	Percent Connected T1 or better	Total Connected	Total Percent Connected
Elementary Schools	1136	31	503	602	52.99	1105	97.27
Middle Schools	275	2	85	188	68.36	273	99.27
High Schools	275	7	70	198	72	268	97.45
Combined Schools	48	1	23	24	50	47	97.92
Special Ed Schools	32	3	3	26	81.25	29	90.63
Alternative Schools	37	5	8	24	64.86	32	86.49
STATE	1803	49	692	1062	58.93	1754	97.28

INTERNET CONNECTIVITY BY REGION

The percent of schools connected to the Internet with high speed T1 connections ranges from a low of 28 percent in Region III to a high of 89.96 percent in Region IV.

The percent of schools not connected to the Internet ranges from a low of zero (all schools connected) in Region VI to a high of 11.29 percent in region VII.

Virginia Superintendent's Regions

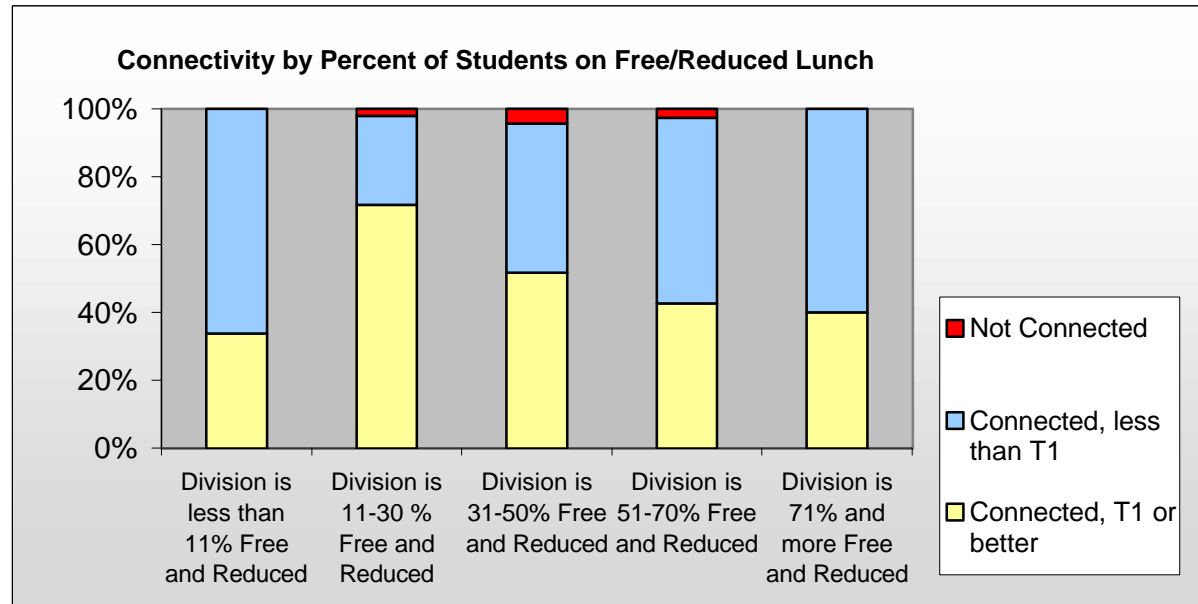


Connectivity by Region				
Region	Percent Not Connected	Percent Connected < T1	Percent Connected T1 or Better	Percent Connected
Region I	1.05	42.93	56.02	98.95
Region II	0.82	42.58	56.59	99.18
Region III	2.00	70.00	28.00	98.00
Region IV	0.67	9.38	89.96	99.33
Region V	8.16	53.06	38.78	91.84
Region VI	0.00	68.42	31.58	100.00
Region VII	11.29	50.00	38.71	88.71
Region VIII	2.82	22.54	74.65	97.18

Virginia Department of Education Internet Connectivity Survey
September 1999

**INTERNET CONNECTIVITY BY
PERCENT OF STUDENTS ON
FREE/REDUCED LUNCH**

As with the student to Internet-connected computer ratio previously discussed, a school's Internet connection speed does not appear to be directly related to the percent of students in the division eligible for free or reduced lunch.

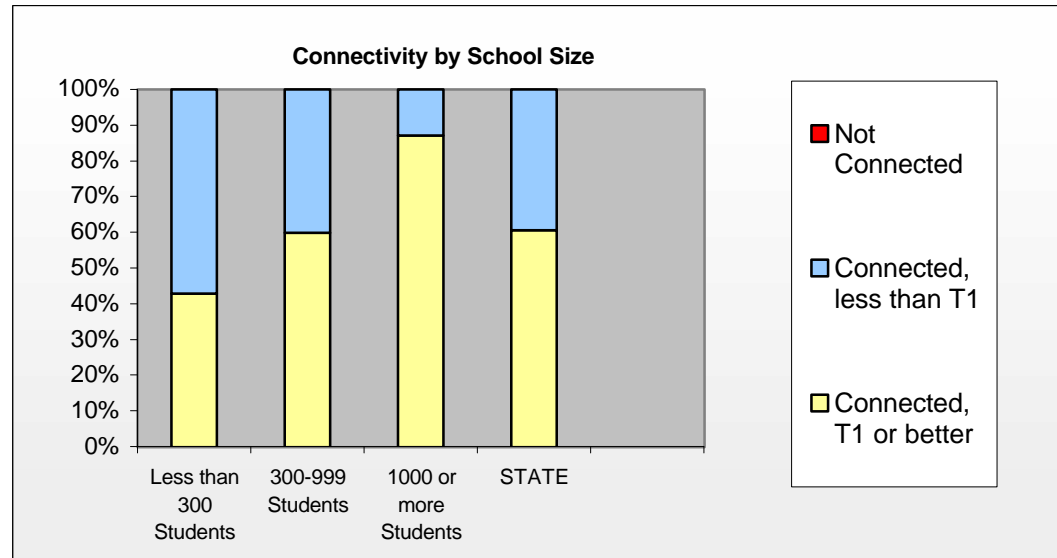


Connectivity by Percent of Students on Free/Reduced Lunch						
<i>Percent Students on Free/Reduced Lunch</i>	Total Number of Schools	Number not Connected	Number Connected < T1	Number Connected T1 or better	Percent Total Connected	Percent Connected
Division is less than 11% Free and Reduced	89	0	59	30	89	100
Division is 11-30 % Free and Reduced	872	18	229	625	854	97.94
Division is 31-50% Free and Reduced	530	23	233	274	507	95.66
Division is 51-70% Free and Reduced	307	8	168	131	299	97.39
Division is 71% and more Free and Reduced	5	0	3	2	5	100
TOTAL	1803	49	692	1062	1754	97.28

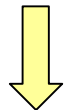
Virginia Department of Education Internet Connectivity Survey
September 1999

**CONNECTIVITY
BY SCHOOL SIZE**

Larger schools in Virginia are more likely to have high-speed Internet connections.



Additional data on
next page



Connectivity by School Size							
School Size	Total Number of Schools	Number not Connected	Number Connected < T1	Number Connected T1 or better	Percent Connected T1 or better	Total Connected	Percent Connected
Less than 300 Students	319	29	166	124	38.87	290	90.91
300-999 Students	1253	20	496	737	58.82	1233	98.4
1000 or more Students	231	0	30	201	87.01	231	100
STATE	1803	49	692	1062	58.9	1754	97.28

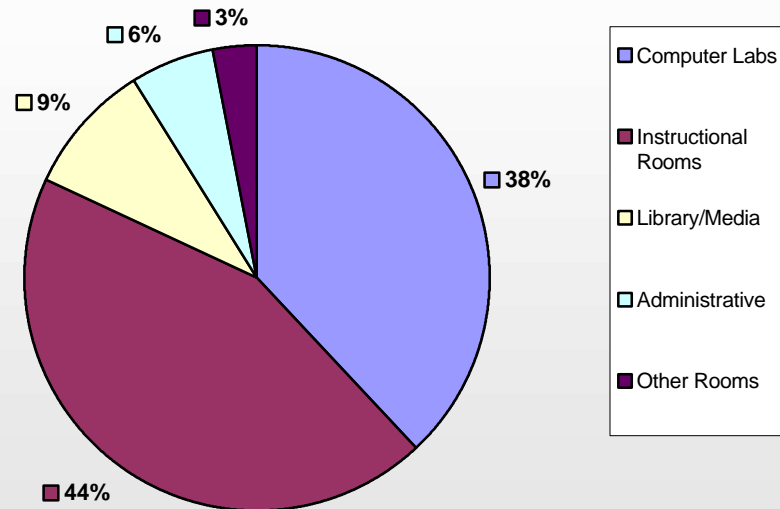
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Connectivity by School Size								
<i>School Type</i>	<i>School Size</i>	Total Number of Schools	Number not Connected	Number Connected < T1	Number Connected T1 or better	Percent Connected T1 or better	Total Connected	Percent Connected
Elementary Schools								
	Less than 300 Students	411	18	159	234	56.93	393	95.62
	300-999 Students	719	13	343	363	50.49	706	98.19
	1000 or more Students	6	0	1	5	83.33	6	100
		1136	31	503	602	52.99	1105	97.27
Middle Schools								
	Less than 300 Students	51	0	14	37	72.55	51	100
	300-999 Students	167	2	68	97	58.08	165	98.8
	1000 or more Students	57	0	3	54	94.74	57	100
		275	2	85	188	68.36	273	99.27
High Schools								
	Less than 300 Students	46	3	11	32	69.57	43	93.48
	300-999 Students	125	4	43	78	62.4	121	96.8
	1000 or more Students	104	0	16	88	84.62	104	100
		275	7	70	198	72	268	97.45
Combined Schools								
	Less than 300 Students	16	0	10	6	37.5	16	100
	300-999 Students	31	1	13	17	54.84	30	96.77
	1000 or more Students	1	0	0	1	100	1	100
		48	1	23	24	50	47	97.92
Special Ed Schools								
	Less than 300 Students	32	3	3	26	81.25	29	90.63
	300-999 Students	0	0	0	0	---	0	---
	1000 or more Students	0	0	0	0	---	0	---
		32	3	3	26	81.25	29	90.63
Alternative Schools								
	Less than 300 Students	35	5	8	22	62.86	30	85.71
	300-999 Students	2	0	0	2	100	2	100
	1000 or more Students	0	0	0	0	---	0	---
		37	5	8	24	64.86	32	86.49

INTERNET COMPUTERS BY LOCATION IN THE SCHOOL

In Virginia, an average of 15 Internet-connected computers, or 38 percent, are in each computer lab. An average of 7 computers, or 9 percent, are in each library/media center. Virginia classrooms have an average of only 1 Internet-connected computer in the classroom. Internet computers in the classroom represent 44 percent of the total number of Internet computers in Virginia schools.

Where are Internet Computers located in Virginia schools?



Internet Computers by Location in the School

Type of Room	Count	Internet Computers	Average Number in Room	Percent
Computer Labs	2920	45131	15.46	38
Instructional Rooms	51755	53022	1.02	44
Library/Media	1538	11117	7.23	9
Administrative	5956	6793	1.14	6
Other Rooms	4929	3204	0.65	3
TOTAL	67098	119267	1.78	100

Virginia Department of Education Internet Connectivity Survey
September 1999

Internet Service Providers to Virginia Schools			
Internet Service Provider	Number of Schools Using this Provider	Internet Service Provider	Number of Schools Using this Provider
ATT WORLD NET	7	Nesbee Cable	1
BBN PLANET	57	Net Access	13
Bealenet	6	Network VA	451
Bealnet	3	PECPS	3
Bedford Cable	4	R & B Internet	10
Bell Atlantic	70	regional consortium of school divisions and public library	3
Bell Atlantic Internet Service	251	Rivernet	3
CableVision Communications	21	Rockbridge Area Networking Group	2
CFW Communications	34	SBO	21
Citizen's Telephone Cooperative	5	Shenandoah Tel Co	9
ComCast (Local Cable Provider)	17	shentel.net	6
Cox Cable	53	Sprint	232
Currently DIT. Changing to Bell Atlantic ASAP	7	Sprint link	6
Danville Public Schools	14	Summit Communications	2
Edge Computers DBA: Northern Neck Networks	1	swva.net	6
Erols	5	swva.net & neocom.net	1
Erol's Virginia Pen	1	Sylvan Information Services	5
Frederick Co. Schools	15	Tazewell y Public Schools	16
Gemlink	3	TDS.NET	3
GTE	7	Techcom	19
Halifax County Schools	17	U.S. West	5
Ideation World, Inc.	10	Unknown	1
InfiNet	81	UUnet	57
Intermedia	18	Virginia Pen	2
MountaiNet	15	WCS Dept IS&MP	15
		WHRO	140
51 Internet Service Providers -- 1754 Schools Connected			

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